Quality Assurance

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EPA Region III Volunteer Summit

August 9, 2013

What We Will Learn

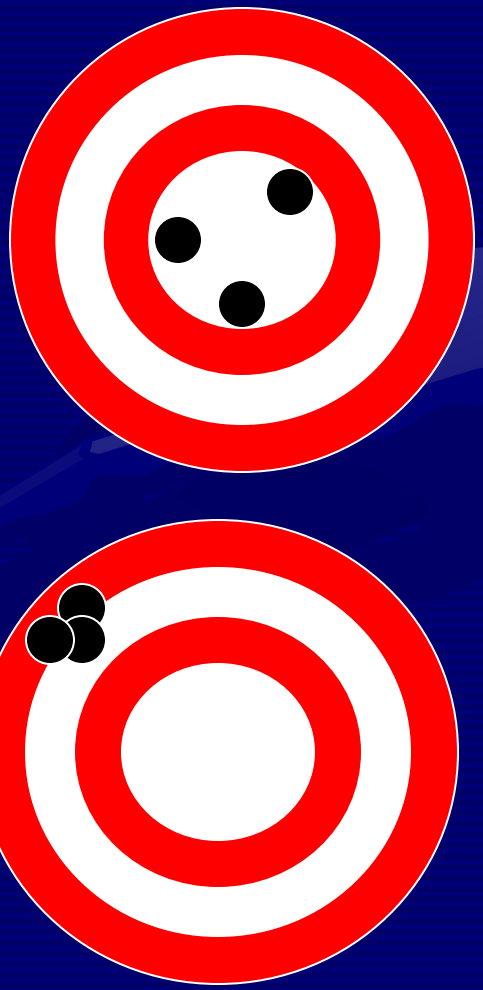
- See how Virginia uses volunteer monitoring data
- Learn key Quality Assurance and Quality Control (QA/QC) procedures
- Learn key terminology and their importance in a quality monitoring program
- Use the provided materials to develop a monitoring plan
- Review a sample Quality Assurance Project Plan

Categories For Non-agency Data

- Level I- not approved- (no VADEQ approved QAPP or methodologies)
  - Data may be used by DEQ to identify sites that need follow-up monitoring by DEQ
- Level II- partially approved-(Approved QAPP, use similar but not VADEQ or EPA approved methodologies)
  - Could be used for 305(b) assessment purposes but not 303(d) Listing as alternative methodologies may not be as accurate
- Level III - approved by DEQ- (Approved QAPP, and use VADEQ approved methodologies)
  - Data used in both 305 (b) assessment and 303(d) list

Accuracy and Precision

- **Accuracy-** Measures how close your results are to a *true* value. The smaller the difference between the measurement and its "true" value, the more accurate the measurement
- **Precision-** Degree of agreement among repeated measurements.



Measuring Accuracy and Precision

- Reference sample
  - Measures accuracy
  - Sample of a known value that tests should agree with
  - Can use a separate lab or method to verify results
- Split or duplicate samples
  - Measures precision
  - Easy to perform in the field or lab
  - 10-20% usually acceptable difference in split samples

Bias

- **Bias-** is a prejudice to predetrmined result.
- Bias can creep into even the most well intended study.
- To prevent bias, proper planning and execuation of a project is important

Ways To Stop Bias

DON'T

- Assume that the project will generate a result you are expecting
- Point fingers at specific parties
- Ignore data that doesn't seem to fit

DO

- Careful research on the issue before you begin
- Establish a good monitoring plan to investigate ALL potential sources
- Seek professional and unbiased expertise when needed
- Step back and review the project to see if you are going down the wrong path

Good Quality Assurance

- Calibrate instruments whenever used
- Collect 5-10% duplicate samples
  - Duplicate samples are from randomly collected sites
- Periodically perform a reference sample
  - Reference sample is in the expected range of the test
- Review data to note any trends in results
- Flag any data that fails the above checks
  - Never remove data that meets quality assurance guidelines but do not agree with the study goals

Good Quality Assurance 2

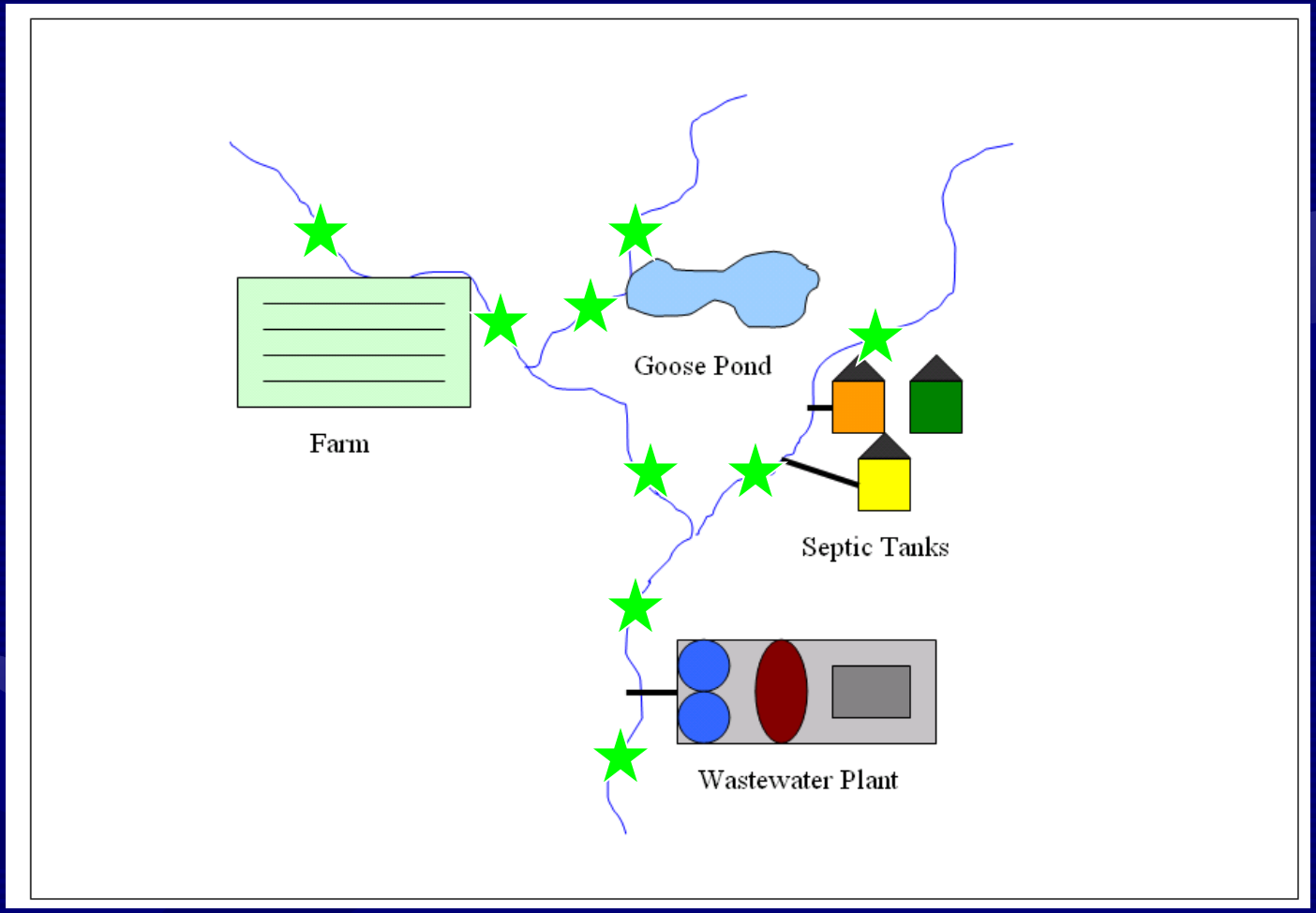
- Collect multiple samples at each site
  - Usually 10 or more samples
- Avoid ‘stacking’ sampling conditions unless it is a defined goal in the QAPP/SOP
  - If sampling for a specific event such as after a rain event, it should be noted in the documents so data users can decide if the data meets their requirements

Monitoring Plan Exercise

A Potty Problem In Bob's Creek

- Using the provided information, develop a sound monitoring plan to address the problem in the handout
- You have 5 minutes to answer the questions

Recommended Sample Sites



Recommended Study Plan

- Monitor upstream and downstream locations of each suspected source
- Collect 5-10% split samples to verify test precision
- Monitor at least 10 times during the course of an entire year to several years to cover different seasons.
- Monitor on a set schedule (e.g. first Tuesday of each month) to avoid ‘stacking’ data based on rainfall or other variables
- Collect at least one rain event sample to measure runoff contribution

Quality Assurance Project Plan

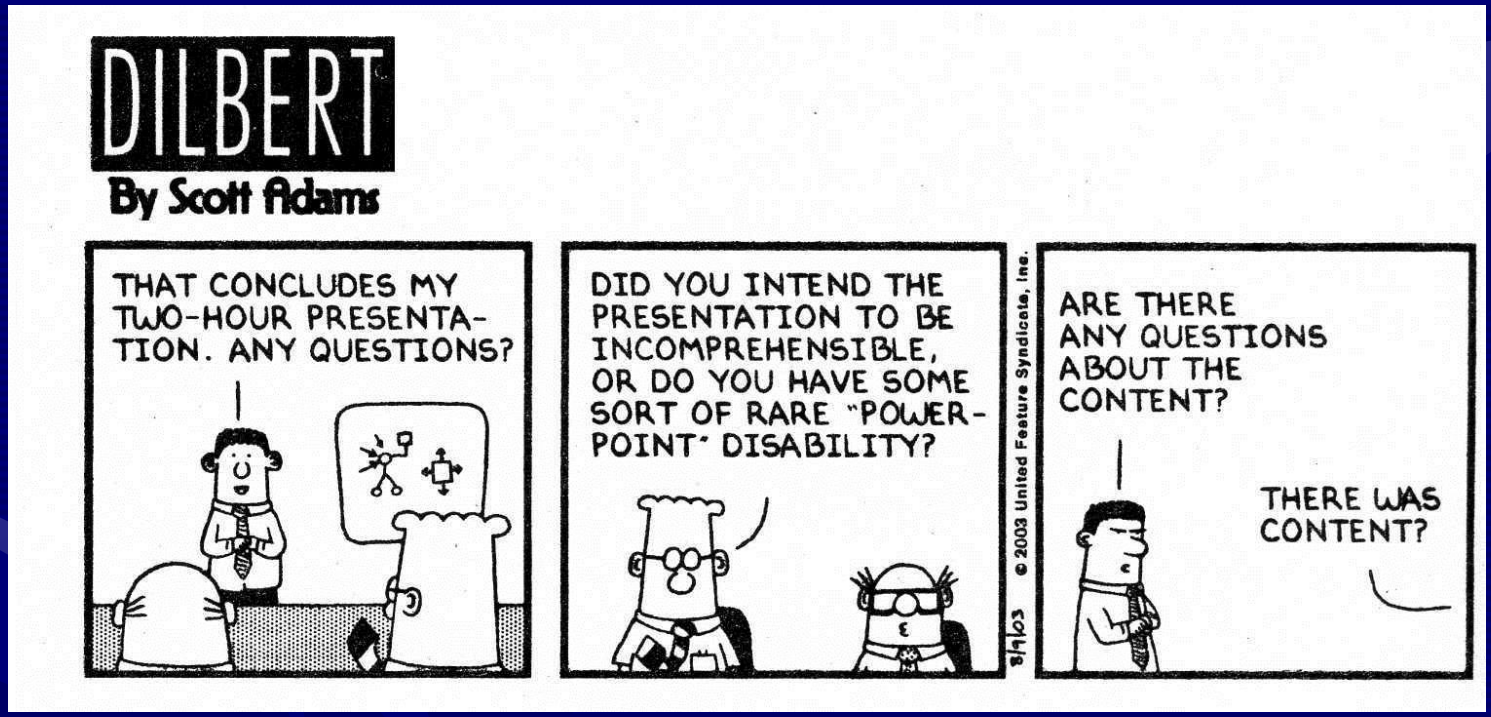
- Document provides data generators and users an in depth understanding of the project.
- Defines all quality assurance (QA) procedures used in the project
  - Outline of project and positions within the group
  - Training requirements
  - Ratio of duplicate and reference sampling
  - Calibration and QA checks for field and lab tests
  - Procedures used to check data quality

Standard Operating Procedure

- Document outlining specific steps of the project
  - Calibration and maintenance of equipment
  - Calibration and field log sheets
  - Sampling procedure
  - Procedure to enter/upload data
- The SOP can be included as an appendix of a QAPP
- SOP should be provided to volunteers to refer to while in the field

QAPP Overview

Questions?


DILBERT
By Scott Adams
THAT CONCLUDES MY TWO-HOUR PRESENTATION. ANY QUESTIONS?
DID YOU INTEND THE PRESENTATION TO BE INCOMPREHENSIBLE, OR DO YOU HAVE SOME SORT OF RARE "POWERPOINT" DISABILITY?
8/4/03
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ARE THERE ANY QUESTIONS ABOUT THE CONTENT?
THERE WAS CONTENT?